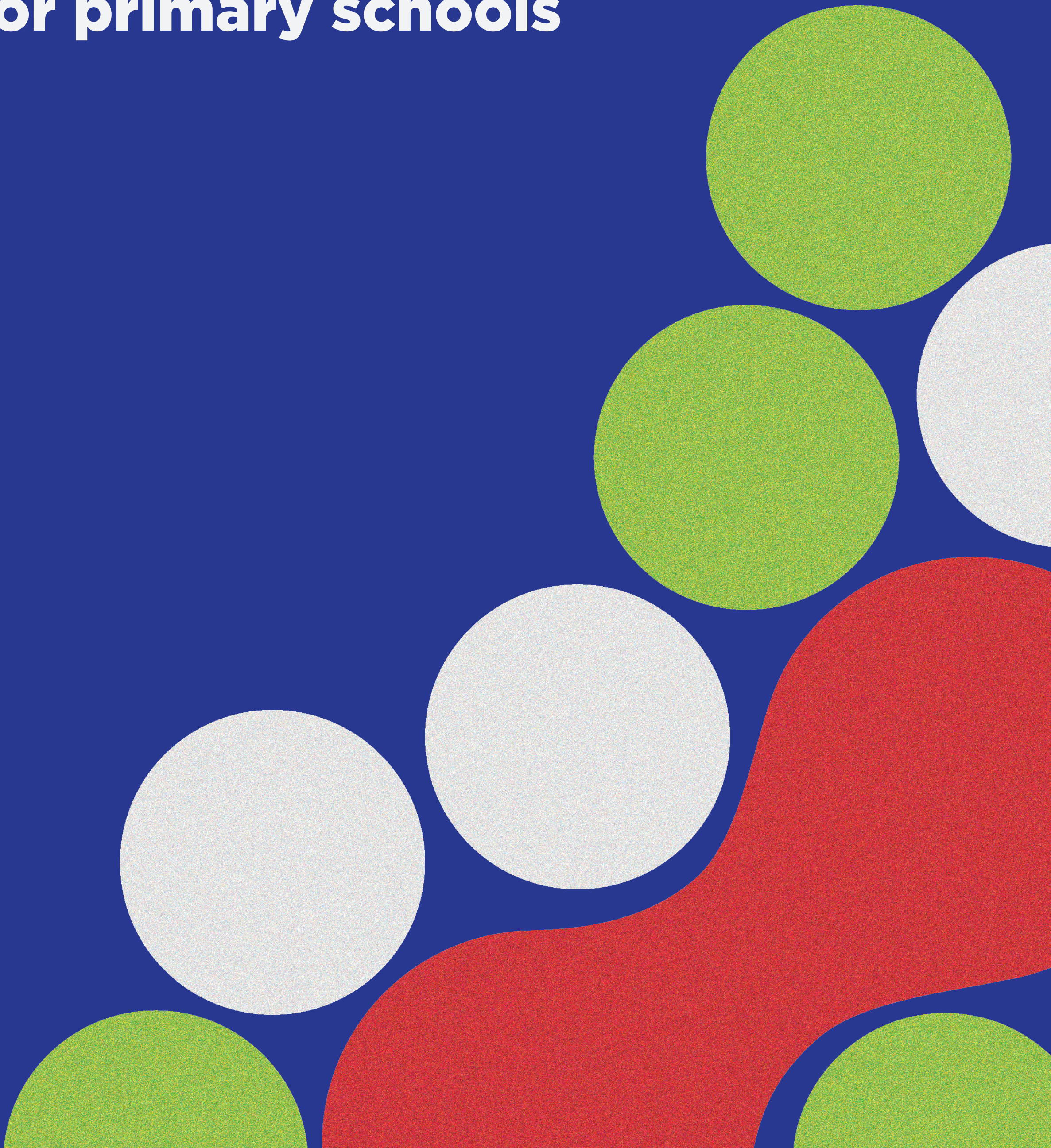
Food and Agriculture
Organization of the
United Nations

Guidance on developing forest education programmes for primary schools



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Guidance on developing forest education programmes for primary schools

First revision

Food and Agriculture Organization of the United Nations
Rome, 2024

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Contents

Abbreviations iv

Foreword v

1 Introduction 1

2 The Forests for a Sustainable Future project 3

2.1 The pedagogic approach 6

3 Programme development phases 10

Phase 1: Preparation 12

Phase 2: Content development 17

Phase 3: Deployment 23

4 Conclusion and recommendations 26

4.1 Foster an enabling environment 27

4.2 Ensure a participatory process 27

4.3 Ensure relevance in the local context 28

5 Notes 30

Annex 1. Summary of forest education programme structure **31**

Annex 2. Sample activities **34**

Annex 3. Resources **35**

Abbreviations

BMEL	Federal Ministry for Food and Agriculture (Germany)
ESD	Education for Sustainable Development
FAO	Food and Agriculture Organization of the United Nations
K2F	Kids to Forests
SDG	Sustainable Development Goal
SDW	Schutzgemeinschaft Deutscher Wald

Foreword

Forests are essential for planetary health and the livelihoods and food security of billions of people, but they are under threat. Now, more than ever, we must build awareness of the importance of forests and work towards their conservation and responsible management.

People are increasingly disconnected from nature, and there is a widespread lack of awareness and understanding of forests and their benefits. We can change this by improving forest education.

The Global Assessment of Forest Education,[1] published by FAO in 2022, surveyed more than 2 700 forestry professionals, teachers, school administrators and forestry students around the world. It found that, in many countries, learning materials for forest education in primary schools are absent or available to only a limited extent – in Africa, for example, primary schools lack basic forest education resources. Overall, the assessment found, most forest-related topics – especially the cultural and social values of forests – are covered inadequately at the primary-school level globally. Even where forest-related topics are explored in classrooms, approaches rarely feature outdoor learning.

Given the generally parlous state of forest education worldwide, it is pleasing that global momentum for boosting it is building. The previous two World Forestry Congresses have both stressed the importance of forest education: the Durban Declaration (2015)[2] recognized the importance of investing in forest education, engaging youth and attracting young people to work in the forest sector, and the Seoul Forest Declaration (2022)[3] called for greater investment and capacity building in forest communication and education. Forest-related education, training and extension is a thematic area for action in the United Nations Strategic Plan for Forests 2017–2030, and ensuring access to education for sustainable development is a key target in the 2030 Agenda for Sustainable Development.

FAO understands the importance of forest education. At the 26th session of the Committee on Forestry in 2022, the Director-General emphasized the need for investment in education and career development to enable young people to develop the skills needed to shape the continuously evolving forest sector. FAO is working with other members of the Collaborative Partnership on Forests on an initiative to rejuvenate forest education.[4]

I expect this publication, *Guidance on Developing Forest Education Programmes for Primary Schools*, to make an important contribution to these efforts and commitments. It builds on lessons learned in an FAO project in the Philippines and the United Republic of Tanzania to develop forest education programmes using an interactive, experiential learning approach. This approach, called “education for sustainable development”, emphasizes skills, abilities and values such as empathy, self-reflection, critical thinking and collaborative decision-making and involves work both inside and outside the classroom.

Guidance on Developing Forest Education Programmes for Primary Schools is a tool to help educational institutions improve and expand forest education for primary-school-aged pupils, and it is also a call to action. Forest education that nurtures children’s innate love of nature will help create a generation capable of managing forests sustainably and thereby foster more inclusive, resilient and sustainable societies and a healthier planet. We must lay the foundations today.

Z Wu

Zhimin Wu
Director, Forestry Division
Food and Agriculture Organization
of the United Nations (FAO)

Book
take me
is strong

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1 Introduction

Forests are one of humanity's biggest assets in the fight against climate change. They are also key for addressing biodiversity loss, ensuring water supplies, sustaining agricultural production and moving towards a more sustainable model of human development.

Today, more than half the world's people live in urban areas; by 2050, some 70 percent are expected to do so. Rapid urbanization is creating a new challenge – people are increasingly disconnected from nature, and there is a widespread lack of awareness and understanding of forests and their benefits.

Providing children with a foundation for understanding the vital roles of forests is crucial for safeguarding natural resources for future generations. Raising awareness among the children of today about sustainable use and conservation will encourage the young adults of tomorrow to make responsible decisions about the environment. This begins with strengthening environmental education programmes that stimulate interest in nature and, in the long run, create ecoliterate citizens who can help ensure the sustainable management of the wider environment, including forests.

There is a clear need and also momentum to provide primary-school children with opportunities to learn about forests and how they can be used sustainably and thereby protected and maintained over time. Inspiring children from an early age about forests can also encourage them to engage in careers that benefit both society and the environment.

This publication is intended for use in countries and other jurisdictions interested in expanding forest education among primary-school-aged children. It builds on the lessons learned in a project managed by FAO (Box 1 describes FAO's overall role in forest education) to create forest education programmes in the Philippines and the United Republic of Tanzania (see Chapter 2).

The aim is to assist decision-makers and educational authorities and institutions interested in pursuing forest education for primary-school-aged pupils in their countries. The guidance is designed for the production of content that can be used as a new subject in national school curricula, for integrating into and complementing existing school programmes, and for informal educational activities, such as in after-school clubs.

Box 1 FAO's work in education

FAO has a long history of participation, leadership and experience in policymaking processes on forests, natural resources and sustainable development and in providing associated technical support. It has also had a long engagement in forest education, establishing the Advisory Committee on Forest Education in 1964 and later the Advisory Panel on Forest Knowledge. As a knowledge organization, FAO has a mandate from the Advisory Panel to disseminate information globally and thereby strengthen global and regional forest knowledge networks and help sustain the future of forest education worldwide. FAO's regional forestry commissions and Committee on Forestry have called on FAO to strengthen its work in this area, potentially through an enlarged project portfolio.

In addition to the Forests for a Sustainable Future project, FAO has been involved in creating various other forest education materials for children, contributing to products such as the State of the World's Forests teaching[5] and learning[6] guides, the Youth and United Nations Global Alliance Youth Guides[7] and Challenge Badges,[8] and the video game Forest Kids,[9] developed in collaboration with the European Space Agency. FAO's involvement in education includes dedicating an edition of its annual International Day of Forests to "Forests and Education"[10] and contributing to the Kids-to-Forests[11] (K2F) initiative (in the Asia-Pacific region). The K2F, which has been piloted in Cambodia, China, Fiji, the Lao People's Democratic Republic, Mongolia, the Philippines and Thailand, builds awareness and appreciation among children and youth of the importance of forests and how they, as young citizens, can contribute to sustainable forest management. With its emphasis on both education and fun, the project has nurtured 500 "earth ambassadors" – some of whom have since studied forestry or environmental science at tertiary level.

2 The Forests for a Sustainable Future project

This document builds on experiences gained in a project funded by the German Federal Ministry for Food and Agriculture (BMEL) and implemented by FAO in collaboration with the governments of the Philippines and the United Republic of Tanzania to develop education materials based on an interactive, experiential, forest-based learning approach.

FAO launched the project, Forests for a Sustainable Future: Educating Children[12] (GCP/INT/349/GER), in 2019 with the aim of increasing awareness among children aged 9–12 about forests and the need to manage them sustainably. The Organization worked closely with governments and experts in the Philippines and the United Republic of Tanzania to develop the programmes according to the "education for sustainable development" (ESD) approach and to promote their use in primary schools in those countries. The programmes were created in collaboration with the German nature conservation association, Schutzgemeinschaft Deutscher Wald (SDW), which has experience and certified expertise in the development of educational material based on the ESD approach.

In the Philippines, the project was implemented from 2021 to 2023 in partnership with the country's Department of Education and the Forest Management Bureau in the Department of Environment and National Resources. A taskforce was established

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The Water Cycle

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as a preliminary step, comprising an education expert, a forest technical specialist, and technical focal points appointed by the two participating departments. The taskforce helped steer development of the educational content and ensure ongoing communication and commitment by the institutional partners ultimately responsible for its official approval and adoption. It was determined that a full revision of the curriculum was unlikely in the Philippines in the foreseeable future and therefore the most feasible option would be the integration of a forestry programme into existing school subjects. Specific links in the curriculum were identified for forest-related activities by mapping existing lesson plans. The Department of Education maintains a platform to provide teachers with additional learning materials, and it was determined that this would be a suitable means for distributing the forest education programme to schools and teachers. The modules were subject to a formal quality-assurance process to qualify for the platform.

The project was implemented in the United Republic of Tanzania from 2019 to 2023 in collaboration with the Director of Forestry and Beekeeping in the country's Ministry of Natural Resources and Tourism, the Ministry of Educational and Vocational Training, and Tanzanian forestry experts and educators. It produced three modules designed to teach the multifunctionality of forests and their sustainable management. Fully illustrated teachers' and pupils' books were produced for each module. Locally relevant content for the modules was developed through focus-group discussions and workshops with local teachers and forestry experts based on the results of preliminary research and a needs assessment conducted by a Tanzanian education expert. A forestry expert from the Tanzanian Forest Institute was engaged to ensure the technical accuracy of the modules and to adequately reflect the realities of Tanzanian forests and their biophysical, economic and social attributes. A "pre-pilot" of draft lessons was tested with teachers and pupils at a primary school in Dar es Salaam to ensure that the pedagogic approach and lesson format were appropriate and effective.

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A key learning from the project is that developing a forest education programme requires expertise in both forestry and education, as well as significant buy-in from local and national stakeholders, including teachers and schools. To ensure a positive reception and the ongoing use of the materials, and to maximize the potential for the inclusion of a forest education programme in the national curriculum, the process for developing content should involve those government bodies in charge of education and forest-related issues, as well as teachers, senior school staff, and other key stakeholders.

2.1 The pedagogic approach

The forest education modules developed under the project use the ESD pedagogic approach, which empowers learners to make informed decisions and take responsible action for environmental integrity, economic viability, and a just society for present and future generations. The approach derives from the "ESD for 2030" education programme led by the United Nations Educational, Scientific and Cultural Organization (UNESCO),[13] which builds on work undertaken as part of the United Nations Decade of Education for Sustainable Development (2005–2014) and the Global Action Programme on ESD (2015–2019).[14]

The ESD approach emphasizes skills, abilities and values such as empathy, self-reflection, critical thinking, collaborative decision-making, and taking responsibility for present and future generations (Box 2). Using this approach, teachers help pupils develop their abilities to recognize, analyse and assess the sustainability of processes and practices. This should enable them to adopt sustainable practices in their own lives and to play an active part – locally and globally – in sustainable development. The modules use hands-on activities and interactive educational games to increase knowledge about forests and raise awareness of the need for forest protection and sustainable management.

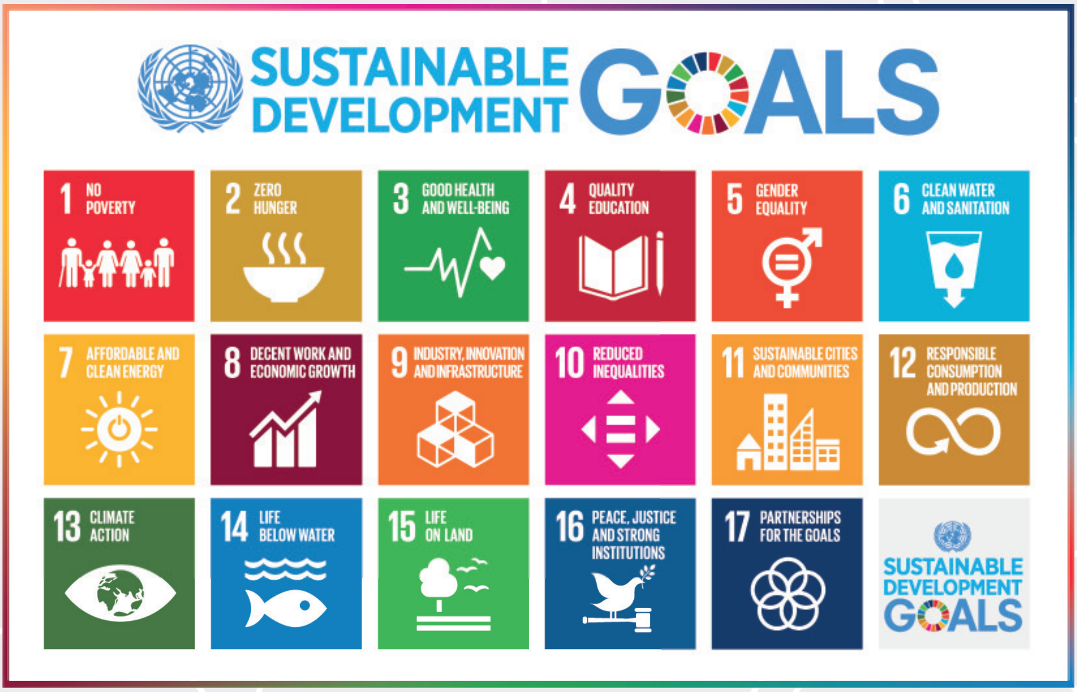
Through the ESD approach, teachers help pupils to assess the sustainability of processes and to adopt sustainable practices in everyday life.

ESD aims to develop the ability of pupils to solve problems and use fact-based knowledge in their actions. In the ESD approach, teachers act as partners for self-reflection and encourage pupils to come up with solutions rather than demanding answers. Teachers provide prompts and guidance rather than definitions, and their instructions purposefully lack context to encourage the pupils' ability to infer it autonomously –

in that way, teachers show trust in the pupils' capabilities and skills and treat them with patience and understanding. By learning about forests through interactive and engaging activities, pupils are encouraged to develop the critical thinking skills required to make decisions in favour of the conservation and sustainable use of forests.

Forests also provide a logical entry point to the study of sustainability and the Sustainable Development Goals (SDGs). They are central to achieving SDG 15 (life on land) and contribute to most other SDGs, including SDGs 1 (no poverty), 2 (zero hunger), 3 (good health and well-being), 4 (quality education), 6 (clean water and sanitation), 7 (affordable and clean energy), 11 (sustainable cities and communities) and 13 (climate action).

Given the central role of forests in climate-change mitigation, forest education can enable discussions on climate change in the classroom. Climate change is the main thematic focus of ESD, and the framework is designed to help people respond to the climate crisis as active agents of change.


SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

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Box 2 Key aspects of the "education for sustainable development" teaching approach

Teacher's role and approach:

- The teacher acts as a partner for self-reflection.
- The teacher encourages pupils to come up with solutions rather than demanding answers.
- The teacher provides prompts and guidance rather than definitions.
- The teacher's instructions purposefully lack context to encourage a pupil's ability to infer it autonomously.
- The teacher trusts pupils' capabilities and skills and treats them with patience and understanding.

Pupils are encouraged to:

- be open to the world and to integrate new perspectives;
- think and act in a forward-looking manner;
- acquire knowledge and act in an interdisciplinary manner;
- learn how to deal with incomplete and overly complex information;
- approach decision-making processes in a cooperative manner;
- learn how to cope with dilemmas in decision-making situations;
- take part in collective decision-making processes;
- self-motivate to take action and spur others to do the same;
- reflect on their own principles and those of others;
- ground all decision-making and planning actions in the notion of equity;
- plan and act autonomously; and
- show empathy and solidarity towards people in need.[15]

Pupils learn better when:

- The environment promotes their active participation and action-oriented learning.
- Learning takes place in a participatory way and involves everyone.
- They are encouraged to reflect on what has been learned and on the values and perspectives of everyone.
- The learning topics:
  - take past experiences and cultural factors into account;
  - are significant in the pupils' daily lives;
  - directly affect and are interesting to the pupils;
  - can be linked to existing knowledge; and
  - are analysed in an interdisciplinary manner and from different perspectives.

3 Programme development phases

The development of a forest education programme for primary-school-aged children can be divided into three phases:

- a **preparatory phase** comprising six steps;
- a **content development phase**, comprising seven steps; and
- a **deployment phase**, with three steps.

Three key entities can be identified in the development of a forest education programme:

- the proponent – those individuals or institutions wanting to strengthen forest education;
- the taskforce – a group of individuals, at least some of whom represent involved institutions, to steer the overall process; and
- a development team – the small group of experts tasked with developing the education materials.

WHAT IS YOUR FAVORITE FOOD?

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PHASE 1
Preparation

1 Assess the gap
2 Identify key stakeholders
3 Engage relevant government ministries or departments and establish a formal partnership
4 Create a taskforce
5 Appoint a team to develop the content
6 Conduct background research, including a needs assesment

PHASE 2
Content development

7 Convene an inception workshop
8 Ensure that the pedagogic approach has the support of teachers and pupils
9 Identify the key concepts and topics to be covered, and develop a structure
10 Develop the content
11 Identify pilot schools and pre-test selected activities
12 Produce the materials for delivery
13 Pilot the modules in local schools

PHASE 3
Deployment

14 Validate the programme
15 Make the learning materials available
16 Monitor the results

Phase 1

Preparation

1. Assess the gap

The proponent of forest education for primary-school-aged children should undertake a preliminary analysis of the existing curriculum to assess the extent to which key forest-related topics are already covered and therefore the need or otherwise to strengthen the forest education component. Where a gap is identified, the following options could be considered:

- Mainstream forest education into the national school curriculum as a new, self-standing subject, implying the need for an in-depth revision of the entire curriculum. Factors such as existing schedules, timelines and processes for implementing curriculum changes should be considered when proposing forests as a new subject in a curriculum because a lack of alignment with any of these could hinder the process.
- Integrate forest education into existing subjects, such as science and technology, geography and environmental studies, through the development of appropriate educational material that could be made available to teachers to address forest-related issues within the framework of those pre-existing subjects.
- Encourage the delivery of forest education via informal educational opportunities, such as in camps and after-school groups.

In contexts where forests are already well covered in a curriculum, the proponent could consider whether existing lessons would benefit from the development of interactive, hands-on forest-related activities.

2. Identify key stakeholders and obtain their buy-in

The proponent should identify and approach potential stakeholder groups to gauge their interest in participating in the process to develop a forest education programme. Potential stakeholders include relevant government agencies (e.g. education, forestry, environment and industry), primary-school teachers and their representative organizations, civil-society organizations with a role in primary-school education, education academics, forestry training institutions, and forest users (e.g. forest-based companies, Indigenous Peoples and local communities). Stakeholder feedback throughout the process is essential for developing an accurate, balanced forest education programme that produces high-quality education outcomes. Programme development should encompass the diverse values and perspectives of stakeholders and make use of their knowledge and experience. Effective mechanisms will be needed to ensure effective stakeholder participation and communication throughout the development process. Some such mechanisms (e.g. focus groups, surveys, and inception and validation workshops) are described below, but others might also be considered.

3. Engage relevant government ministries or departments and establish a formal partnership

Ideally, the development of a forest education programme will be a joint endeavour of the education and forestry or environment departments and potentially other government bodies. When more than one government body is involved, a formal partnership between them (e.g. through a memorandum of understanding) may be an effective means for ensuring coordination and collaboration on, and joint ownership of, the programme. Establishing a formal agreement in writing will clarify the common intent to develop joint educational materials and facilitate official endorsement of the resultant product.

4. Create a taskforce

Ensuring an appropriate level of expertise and institutional buy-in during all phases of programme development, and obtaining the inputs of other interested parties, can be done by creating a taskforce comprising the principal actors to oversee, contribute to and legitimize programme development. At a minimum, the taskforce should include the proponent, an education expert, a forest technical specialist, and representatives of the decision-making government institutions; it could also include representatives of supportive international institutions, such as FAO, and other stakeholders. The structure and role of the taskforce should be set out clearly in terms of reference. The taskforce will oversee the overall programme development process; one of its most important roles is to appoint the development team (see next step).

5. Appoint a team to develop the content

The development of a forest education programme requires expertise in curriculum development, preferably related to sustainable development and forest-related and environmental issues. The taskforce may appoint an individual or, ideally, a small team with the necessary expertise, as the main means for creating the programme's content. Team members might be drawn from the education department and consultancy companies that specialize in curriculum development and could also include independent education and forestry experts with relevant backgrounds. The development team will be responsible for directly developing lessons and other materials, overseen by the taskforce.

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6. Conduct background research, including a needs assessment

The taskforce may request the development team to conduct research on the existing education system and its forest education content; the level of awareness of forests and the benefits of their sustainable management among pupils and teachers; and the stakeholders who should be involved in programme development.

A structured needs assessment can be used to determine gaps in awareness among pupils of forests and the benefits of sustainable forestry. It might examine the extent of knowledge held by primary-school pupils on forests and key forest-related issues; the degree to which the existing curriculum addresses forest-related topics; the capacity of teachers to implement a forest education programme; and any commonly used methods for forest-related education in primary schools. As much information as possible should be gathered as part of the foundation on which the educational modules will be built.

Data can also be collected through surveys with pupils and teachers, ideally from several schools, using questionnaires and face-to-face interviews. The schools should be selected strategically to ensure they represent the diversity (e.g. geographic, socio-economic and environmental) of the national educational landscape. Surveys might be used to obtain information on pupils' learning experiences related to forests and their understanding of the role and importance of forests. They might also seek basic information on the school calendar, class setup (e.g. class size), the local forestry context, and any existing forest-related teaching components. This step should also include a thorough examination of the formal requirements and standards for validating the programme to ensure that it qualifies for use in schools (when designed for this purpose).

Phase 2

Content development

7. Convene an inception workshop

An inception workshop brings together the proponent, taskforce members, representatives of the key entities, other stakeholders and the development team. Among other things, the workshop can be used to officially launch the process to develop the forest education programme; present the outcomes of the previously conducted needs assessment; provide an overview of and seek feedback on the proposed pedagogic approach to be applied in the programme; and agree on the workplan and timeline for the programme development process.

8. Ensure that the pedagogic approach has the support of teachers and pupils

The Forests for a Sustainable Future project used the ESD pedagogic method (see Chapter 2), which employs a hands-on, interactive approach designed to empower learners to make informed decisions and take responsible action. The approach encourages learners to construct their own knowledge rather than rely on information transmitted by the teacher. Regardless of the method used, it is essential that teachers understand and accept it. The inception workshop (step 7) is an appropriate forum for presenting the proposed pedagogic approach and receiving feedback on it. The approach will also be tested during the pre-piloting and piloting of the modules (steps 11 and 13).

9. Identify the key concepts and topics to be covered, and develop a structure

The development team, overseen by the taskforce, should now have sufficient understanding of the context, needs and pedagogy to begin developing a detailed outline of the programme. This could involve the following:

- The taskforce provides the development team with criteria for programme content.
- The development team holds focus-group discussions with stakeholders to identify the key topics to be covered and develops a draft outline of the programme.
- The taskforce reviews the draft and makes recommendations for improvement.

Criteria for content could include the following:

- locally relevant;
- fills important gaps in the existing curriculum; and
- meets academic requirements.

The process for developing the outline should be participatory, building on the findings and outcomes of the needs assessment and inception workshop. It should also be tailored to suit the way in which the programme will ultimately be delivered to children (see step 1). Box 3 outlines the structures used for forest education programmes in the Philippines and the United Republic of Tanzania, which could provide starting points for other programmes.

MISITU
Faida za misitu
Athari za matumizi ya misitu kupita kiasi
i. Mmomo

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Box 3 Structure of the forest education programmes in the Philippines and the United Republic of Tanzania

The forest education programmes developed in the Forests for a Sustainable Future project were organized by modules, each with a different theme. In the Philippines, a total of 12 modules were developed, four for each grade. Each module consists of three chapters, each of which is linked to one or more competencies already in the curriculum. To ensure that teachers can incorporate the activities in their lesson plans, each chapter consists of a single lesson, developed to be relatively quick (15–20 minutes); moreover, the lessons follow the "5E" model (Engage, Explore, Explain, Elaborate and Evaluate), which is the educational framework employed in Philippine schools. In addition to the short lessons for the three chapters to be taught during regular school hours, each module includes a longer lesson that can be used in clubs and camps promoted by the Youth for Environment in Schools Organization, a recognized co-curricular organization that consolidates all school programmes with a focus on the environment and ecology.

Three modules were developed in the United Republic of Tanzania, one for each grade. Each module consists of 8–9 chapters and each chapter contains 3–4 lessons of 40 minutes each (coinciding with the length of existing classes). The modules are intended to be taught once per week over the course of a school year but are also adaptable for use in after-school clubs. Each chapter has the same structure: a first lesson in which the teacher introduces a topic; 1–2 practical lessons, in which the pupils explore the topic through games and activities; and a final lesson for reflection and discussion. In total, the three modules contain 26 chapters.

Annex 1 presents tables summarizing the programmes in the Philippines and the United Republic of Tanzania, along with lists of the topics developed.

10. Develop the content

The development team can now prepare the materials and modules. It may be helpful to draw on the materials developed in the Philippines and the United Republic of Tanzania or by other similar programmes. In adapting existing programmes to a new context, the following should be borne in mind: class size; the availability of material for teachers to perform the proposed activities; the time allocated for the activities; and the potential for access to sufficient space (inside and outside the classroom) for performing the activities. Annex 2 presents sample activities from the programmes developed in the Philippines and the United Republic of Tanzania. Annex 3 provides a selection of FAO online resources on the themes dealt with by the forest education programmes developed by the Forests for a Sustainable Future project.

11. Identify pilot schools and pre-test selected activities

A selection of proposed activities should be tested in the classroom at a relatively early stage of material preparation. Such “pre-piloting” can indicate the feasibility of the approach and the appropriateness of the format and enable course correction, as necessary. If the pedagogy of the activities differs from usual practice in the jurisdiction, pre-testing will also provide insight into the amount of detail required in instructions and explanations. A range of schools should be used for pre-piloting, selected strategically to ensure they represent the diversity of contexts in which the materials will ultimately be used. Ideally, for continuity, the selected schools should be among those surveyed as part of the initial needs assessment (step 6). The pre-pilot should be documented with videos and photographs.

12. Produce the materials for delivery

The materials should be edited and designed to conform with official requirements and for ease of delivery. One effective approach, used in the Forests for a Sustainable Future project, is to compile the instructional material in easy-to-read books for teachers; pupils' books may also be produced. The teachers' books should contain sufficient background information to enable teachers to understand the topics, and they should provide clear, step-by-step instructions for teaching the lessons. The pupils' books should follow the structure of the teachers' books – a visually stimulating design will encourage interest and use – to guide pupils through the activities and reinforce learning.

13. Pilot the modules in local schools

The completed modules should be piloted – and revised, as necessary – before finalization. The piloting should be conducted in the same schools selected for pre-piloting (if undertaken; see step 11). To the greatest extent possible, the teachers involved in the pilot should be enthusiastic about forest education and understand the pedagogic approach used; in contexts where the pedagogic approach is little-known, experts in the approach should be available to assist the teachers. The development team should monitor, document and support the piloting process throughout, with a view to adjusting the programme where necessary. As for pre-testing, it is recommended that the pilot be documented with video and photography.

Phase 3
Deployment

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14. Validate the programme

The now finalized programme will need to be validated before it can be used widely in schools. Most jurisdictions have their own validation processes for education materials, and the proponent, development team and taskforce should have ensured that the draft programme meets the requirements for validation.

15. Make the learning materials available

The responsible authority (in many cases the education department) should publish and distribute the forest education programme to teachers and other educators in hardcopy or digital format, following usual processes for the distribution of curriculum materials. Where resources allow, trainings could be held or instructional videos produced to familiarize teachers with the content and methodology and to help ensure that the programme is deployed effectively. It is recommended that a newly released programme is disseminated not only at the institutional level but also through other communication channels, such as social media. Doing so can help raise the visibility of the programme and generate curiosity about it, thus increasing the likelihood of widespread uptake. The video footage and photographs obtained during pre-pilot and pilot testing can be especially useful at this stage by showing its power to inform and capture the imaginations of pupils.

16. Monitor the results

Surveys administered during the needs assessment should be conducted again during deployment (ideally after 1–2 years) to monitor the effectiveness of the programme in helping the pupils learn. The data gathered through this monitoring can inform efforts to improve and adapt the forest education programme over time.

4 Conclusion and recommendations

Raising awareness among today's children about sustainable forest use and conservation will better enable the young adults of tomorrow to make responsible decisions about forests and the environment. In-depth exposure to forestry's role in sustainable development may also encourage some pupils to pursue professions related to forestry and the sustainable management of other natural resources.

This publication presents broad guidance on the development of forest education programmes designed to empower learners to make informed decisions and take responsible action for environmental integrity, economic viability and a just society for present and future generations. The experience gained in developing forest education programmes in the Philippines and the United Republic of Tanzania gives rise to the following three broad recommendations for jurisdictions wishing to develop similar programmes, drawing on the steps outlined in Chapter 3.

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4.1 Foster an enabling environment

Developing a forest education programme requires buy-in by and coordination among diverse stakeholders, including senior education officials, and a conducive policy environment. It is essential, therefore, that key stakeholders and decision-makers are supportive of forest education and recognize the economic, social and environmental importance of forests and their sustainable management. They should also understand the value of an innovative pedagogic approach that relies on child-centred lessons that educate through interactive activities. Awareness-raising activities on the importance of forest education, and policy changes to make forest education a formal element of a curriculum, may be necessary to bring on board those responsible for curriculum development and for the ultimate approval and adoption of learning materials. Adequate funding and other resources are needed to develop a forest education programme. Costs may include those associated with hiring forestry and education experts; convening a taskforce; conducting a needs assessment and background research; convening workshops and focus-group discussions; piloting materials in schools; the editing, visual design and printing of learning materials; and teacher training. Integrating content into a national curriculum will also have budgetary implications and may require awareness-raising in educational departments on the importance of teaching students about forests.

4.2 Ensure a participatory process

Stakeholder participation is essential for developing an accurate, balanced and relevant forest education programme that produces high-quality education outcomes. Programme development should encompass the diverse values and perspectives of stakeholders and make use of their knowledge and experience. Potential stakeholders include relevant government agencies (e.g. education, forestry, environment and industry), primary-school teachers and their representative organizations, civil-society organizations with a role in primary-school education, education academics, forestry training institutions, and forest users (e.g. forest-based companies, Indigenous Peoples and local communities). A diverse set of stakeholders should be engaged actively throughout the development process and given ample opportunity to provide feedback. This may include participation in focus groups, workshops and consultations and in the taskforce or committee responsible for guiding curriculum development. Care should be taken to ensure a gender-balanced approach.

4.3 Ensure relevance in the local context

To fully engage and be relevant to pupils, the topics taught in a forest education programme should feel tangible to them; therefore, efforts should be made to ensure that the programme's content is relevant to diverse local contexts while also exploring the national, regional and global roles of forests. Programme content should refer to, and inform pupils about, a range of plants and animals that are native to their country, local forest uses, and other economic, social, environmental and cultural realities of the country's forests and forest sector. An understanding of the local to national forest context can be obtained through background research, stakeholder engagement, focus groups and workshops. The involvement of local forestry experts will help ensure the technical accuracy and local relevance of the modules and the biophysical, economic and social attributes of local to national forests.

The global body of knowledge and experience on forest education will grow as more jurisdictions develop such programmes, thereby enabling continual learning and increasing impact. Over time, robust, interactive and widely adopted forest education programmes will empower learners to develop the action-oriented awareness and knowledge needed for sustainable and resilient societies.

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FOREST EDUCATION PHILIPPINES

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5 Notes

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Annex 1

Summary of forest education programme structure

Country	**The Philippines**	
Envisaged use	Short lessons: Supplementary material for classes during the school year covering a related topic	Long lessons: Youth for Environment in Schools-Organization camps and clubs
Duration	Short lessons: 15–20 minutes	Long lessons: 30–60 minutes

Topics covered in GRADE 4

Module 1: Benefits of forests

Chapter 1	Ecosystem services from forests
Chapter 2	Forests as sources of food and medicinal plants
Chapter 3	Wood and other non-wood forest products

Module 2: Sustainable forest management

Chapter 1	Status of forests in the Philippines
Chapter 2	Sustainable wood consumption and production
Chapter 3	The importance of sustainable forest management

Module 3: Agroforestry systems

Chapter 1	Benefits of agroforestry
Chapter 2	Trees in agroforestry systems
Chapter 3	Agroforestry best practices for conservation

Topics covered in GRADE 5

Module 1: Wood products and their uses

Chapter 1	Properties of wood products
Chapter 2	Wood as a renewable source of energy
Chapter 3	Making useful products out of wood

Module 2: Pollination

Chapter 1	Forests as habitats for pollinators
Chapter 2	Sustainable beekeeping practices
Chapter 3	Bee products

Module 3: Forests, soils and erosion

Chapter 1	The role of forests in soil formation
Chapter 2	The importance of forests in reducing soil erosion
Chapter 3	The importance of forests in stabilizing the soil

Module 4: Forests and the weather

Chapter 1	How forests can mitigate the effects of flooding
Chapter 2	The role of mangroves in protecting coastlines
Chapter 3	Forests and trees as windbreaks

Topics covered in GRADE 6

Module 1: Benefits of forests

Chapter 1	Ecosystem services from forests
Chapter 2	Forests as sources of food and medicinal plants
Chapter 3	Wood and other non-wood forest products

Module 2: Sustainable forest management

Chapter 1	Status of forests in the Philippines
Chapter 2	Sustainable wood consumption and production
Chapter 3	The importance of sustainable forest management

Module 3: Agroforestry systems

Chapter 1	Benefits of agroforestry
Chapter 2	Trees in agroforestry systems
Chapter 3	Agroforestry best practices for conservation

Module 4: Wood processing

Chapter 1	Introduction to wood products
Chapter 2	Waste from wood and how it can be used
Chapter 3	Wood as an innovative material

Country	**United Republic of Tanzania**
Envisaged use	Weekly lessons during the school year and/or after-school clubs
Duration	40 minutes

Topics covered in GRADE 4

Module 1: Forest products, plants and animals

Chapter 1	Introduction to forests and their biodiversity
Chapter 2	What is a tree?
Chapter 3	Forests and soil
Chapter 4	Animals in the forest
Chapter 5	The life of bees in a colony
Chapter 6	Pollination and bee products
Chapter 7	Beekeeping
Chapter 8	Forest products
Chapter 9	Our forests in the United Republic of Tanzania

Topics covered in GRADE 5

Module 2: Forests, health and well-being

Chapter 1	Properties of wood products
Chapter 2	Wood as a renewable source of energy
Chapter 3	Making useful products out of wood
Chapter 4	Forests as habitats for pollinators
Chapter 5	Sustainable beekeeping practices
Chapter 6	Bee products
Chapter 7	The role of forests in soil formation
Chapter 8	The importance of forests in reducing soil erosion

Topics covered in GRADE 6

Module 3: Forests and the climate

Chapter 1	Weather, climate and forests
Chapter 2	The greenhouse effect and climate change
Chapter 3	Photosynthesis
Chapter 4	Wood and other sources of renewable energy
Chapter 5	Sustainable forest management
Chapter 6	Forest and beekeeping laws
Chapter 7	The work of a forester
Chapter 8	Forests and climate change – what we can do

Annex 2

Sample activities

The complete collection of modules can be accessed on the “Forests for a Sustainable Future: Educating Children” project webpage.*

LESSON 5
Identify foods from the forest
5
Required materials
LESSON 10
Run a photosynthesis relay race
10
Required materials
LESSON 15
Brainstorm and preparation for a play
15
Required materials
Activity 1: Explore and discuss bees
Activity 1: Make a soil profile
Preparation for the next lesson
BEE SUIT WITH HAT AND VEIL
HIVE TOOL
SMOKER
BEE BRUSH

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* https://www.fao.org/forestry/forest-education/100951/en/

Annex 3

Online resources

Agroforestry

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- **FAO.** Sustainable Forest Management Toolbox – Agroforestry. In: *Food and Agriculture Organization of the United Nations.* Rome, FAO. [Cited 12 September 2023]. https://www.fao.org/sustainable-forest-management/toolbox/modules/agroforestry/basic-knowledge/en/

Biodiversity

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Climate change

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Forests and disaster reduction

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Forests and health

- **FAO.** Sustainable Forest Management Toolbox – Health benefits from forests. In: *Food and Agriculture Organization of the United Nations.* Rome, FAO. [Cited 12 September 2023]. https://www.fao.org/sustainable-forest-management/toolbox/modules/health-benefits-from-forests/basic-knowledge/en/

Forests and water

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Forests, nutrition and food security

- **FAO.** Forests for food security, nutrition and human health. In: *Food and Agriculture Organization of the United Nations.* Rome, FAO. [Cited 12 September 2023]. https://www.fao.org/forestry/food-security/en/
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Mangroves restoration and management

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Pollination services and bee products

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